

Microwave-Assisted Functionalization of Carbon Nanotubes and Reactive Synthesis of Nanocomposites, Phase I

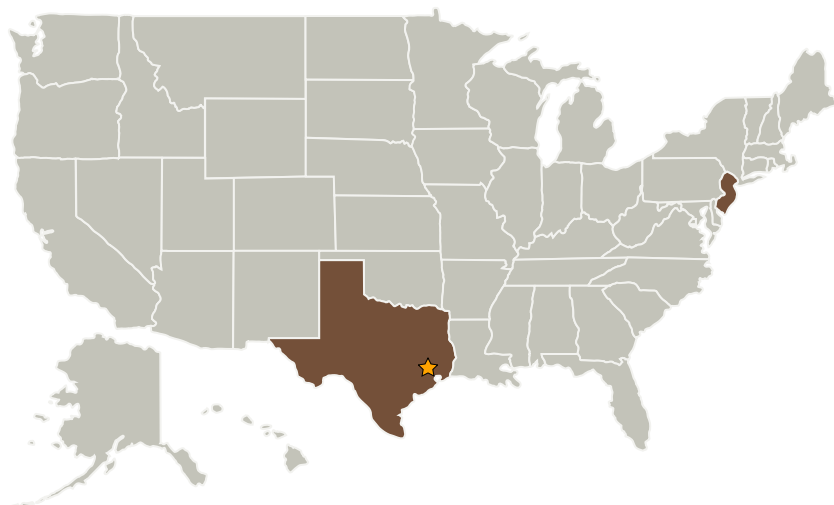
Completed Technology Project (2006 - 2006)



Project Introduction

The Offerers will build on their recent innovation of a microwave-induced route to the rapid functionalization, solubilization and reactive synthesis of carbon nanotube-ceramic and nanotube-polymer composites. The microwave process is environmentally friendly and results in the complete removal of metal catalysts used in the synthesis of the pristine nanotubes. These residual nanoscale metals are known to be toxic. The functionalization will be carried out via different routes so that the nanotubes can be rendered soluble in different solvents including water, alcohols, and nonpolar liquids. This will facilitate mixing with different polymer matrices for fabrication of composites, and also facilitate the formation of coatings and films. The reactive synthesis of ceramic and polymer composites involves the formation of the composite structure on the nanotube sidewalls via a microwave-assisted reaction. This will lead to the formation of a novel class of nanomaterials with unique structural, electronic and thermal properties.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
NanoPulse LLC	Supporting Organization	Industry	Bridgewater, New Jersey



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

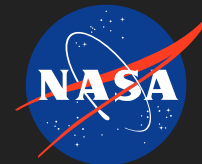
Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

New Jersey

Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines